



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,665	08/22/2007	Hyun Jong Shin	LEE0062US	1835
23413 7590 06/04/2009 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER RUMP, RICHARD M				
ART UNIT 1793		PAPER NUMBER		
NOTIFICATION DATE 06/04/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary

Application No.

10/575,665

Applicant(s)

SHIN ET AL.

Examiner

Richard M. Rump

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

Status of Application

Claims 6-11 are pending and presented for examination.

Claim Rejections - 35 USC §§ 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 & 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent No. 3853788 to Feins.

Regarding claims 6 & 8, Feins discloses mixing an alumina slurry with molybdenum (creating a catalyst suspension with their salts) and then dried and milled. This dried particulate was then intermixed with a cobalt source and a urea source and then calcined (claim 1 & example 1). While the mixture is never expressly crushed, it

would be obvious to a skilled artisan that the milling step would result in granulation and as such achieve the same results.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feins.

Regarding claim 10, the urea is in an aqueous solution (abstract).

Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6881702 to Arnold in view of Feins.

Regarding claims 6-8 & 10-11, Arnold discloses taking a mixture of complex metal oxides which eventually leads to $\text{Mo}_{12}\text{BiCoSiSbK}$ (or similar compositions as outlined in the disclosure; See Arnold: Claim 3). The process involves mixing for example ammonium heptamolybdate, potassium hydroxide, iron nitrate, cobalt nitrate, silica, or MoO_3 , CoO , Fe_2O_3 , SiO_2 , Bi_2O_3 and K_2O mixed together (See examples 1 and 7). The solution was then dried (column 11, line 38) and eventually calcined between 290 and 435 C. While no mixing of a sublimable material is disclosed at this point, Feins discloses in a similar process to add urea between 1 & 8 percent (Feins: claim 1) to the catalyst composition. Therefore it would have been obvious to one having an ordinary level of skill in the art at the time of invention to perform the method of Arnold in view of the urea addition of Feins. The teaching or suggested motivation in doing so is that adding urea increases the catalyst's efficiency and pore size (*inter alia* surface area) (Feins: column 4, lines 4-16). Furthermore, the addition of ammonium oxalate, in the wet or dry form can be used to aid in pore formation (Arnold: Column 4, lines 25-46).

Regarding claim 9, It would be obvious to one having an ordinary level of skill in the art at the time of invention to calcine the catalyst in an earlier step in order to remove unwanted impurities from the catalyst, for example any unwanted oxides or organic species (such as unwanted oxides in a titania catalyst). The time for calcination is commonly arrived at through routine experimentation, as such a *prima facie* case of obviousness exists (In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 4424141 to Grasselli (Cited in prior action) in view of Feins.

Regarding claims 6, 7 & 10-11, Grasselli discloses a process wherein potassium hydroxide, ammonium molybdate, and silica are prepared (It is well known in the art that crushing is a commonly used practice), and then intermixed with cobalt and nickel nitrate along with an aqueous solution of potassium and iron nitrates respectively. This formation is then dried and calcined to produce the final catalyst product (column 1, lines 48-60). See example 1 for a further example. Numerous other mixtures such as alcohols can be used as a liquid medium (column 4, lines 51-66). While Grasselli does not expressly state the usage of sublimable materials, Feins in a method of making a catalyst from a complex oxide states that the one would want to add aqueous urea between 1 & 8 percent (Feins: claim 1) to a moly-cobalt catalyst like that in Grasselli and subsequent calcination between 660 and 1200 F (column 6, lines 27-28). Therefore it would have been obvious to one having an ordinary level of skill in the art at the time of invention to perform the method of Grasselli in view of the urea addition of Feins. The

teaching or suggested motivation in doing so is that adding urea increases the catalyst's efficiency (column 4, lines 4-16).

Regarding the claimed chemical formula wrought from instant claim 7, Grasselli discloses a catalytic composition (evident in Grasselli claim 1 as $A_aG_bL_cD_dE_eQ_fO_x$; wherein: A is an alkali metal, Ti, Cu, Ag and mixtures thereof; G is Ni, Co, Mn, Mg, a Group IIA element, IIB element or mixtures thereof; L is Fe, Cr, Ce, V and/or Eu; D is Bi, Te or mixtures thereof; E is P, As, B, Sb, Ge, Sn, Si, Ti, Zr, rare earth and/or U or mixtures thereof; Q is Mo and/or W; and wherein a is 0.001-2, b is 0.01-10 (equivalent to instant compositional value 'a'), c is 0.01-8, d is 0.1-8, e is 0-3, and f is 11-13.5 (overlaps 12) x is determined by the valence state of the other elements present. However, the instant claimed composition limitations are not expressly stated, but merely overlapped. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (MPEP 2144.05). (recited explicitly in column 3 line 65 bridging to column 4 line 36 of Grasselli)

Regarding claim 9, Grasselli discloses that the catalytic support is calcined, however within where in the process is not expressly stated. Grasselli does give mention that as an example the calcination process of the catalytic support may be done during the final calcination step (column 8, line 63). It would be obvious to one having an ordinary level of skill in the art at the time of invention to calcine the catalyst in an earlier step in order to remove unwanted impurities from the catalyst, for example any unwanted oxides or organic species (such as unwanted oxides in a titania catalyst). The time for calcination is commonly arrived at through routine experimentation, as

such a *prima facie* case of obviousness exists (In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Regarding claim 11, a pre-catalyst precipitate such as propylene is added at an amount of 1.8% (example 4). Furthermore the urea of Feins is added between 1 and 8 weight percent (See Feins: Claim 1).

Response to Arguments

Applicant's arguments filed 13 April 2009 with respect to the rejection(s) of claim(s) 6-11 under 102, 103 of Grasselli have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the above stated prior art.

Conclusion

Claims 6-11 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard M. Rump whose telephone number is (571)270-5848. The examiner can normally be reached on Monday through Friday 7:00 AM-4:30 PM EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571)272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. M. R./
Examiner, Art Unit 1793

/Stuart Hendrickson/
Primary Examiner, Art Unit 1793